



Comprehensive Wastewater Management Plan and Final Environmental Impact Report, and Targeted Watershed Management Plan

Little Pond, Great Pond, Green Pond,
Bournes Pond, Eel Pond, and Waquoit Bay
Watersheds and Recommendations for
West Falmouth Harbor Watershed

Volume #1, Report Text and Tables



September 16, 2013



TOWN OF FALMOUTH

Office of the Town Manager & Selectmen

59 Town Hall Square, Falmouth, Massachusetts 02540
Telephone (508) 495-7320
Fax (508) 457-2573

September 26, 2013

Mr. Richard K. Sullivan, Secretary
Executive Office of Energy & Environmental Affairs
MEPA Office
100 Cambridge Street – Suite 900
Boston, MA 02114

RE: Comprehensive Wastewater Management Plan for Town of Falmouth EEA# 14154

Dear Mr. Sullivan:

Attached for your review is the Final Comprehensive Wastewater Management Plan (CWMP), Final Environmental Impact Report, and Targeted Watershed Management Plan for Little Pond, Great Pond, Green Pond, Bournes Pond, Eel Pond, and Waquoit Bay Watersheds, and Recommendations for West Falmouth Harbor Watershed.

The Town of Falmouth has worked diligently during the last year to develop this document and its adaptive management approach that is key to our environmental and economic sustainability. This document also addresses the various issues raised in the Secretary's Certificate approving the Draft CWMP. We have consulted with the Massachusetts Department of Environmental Protection, the Cape Cod Commission, US EPA, and many other stakeholders on this document and on our overall planning process, and have responded to their input. The Town of Falmouth voters have approved \$5.6 million in design funds for three key elements of this CWMP: sewerage of the Lower Little Pond watershed, upgrades to the Wastewater Treatment Facility in West Falmouth, and widening of Bournes Pond Inlet.

We look forward to the MEPA review of this document so that we can proceed to implementation. If you have any questions, please contact Jerry Potamis, P.E., Falmouth Wastewater Superintendent at 508.457.2543 (jpotamis@falmouthmass.us) or Nathan C. Weeks, P.E., GHD Senior Project Manager at 774.470.1633 (nate.weeks@ghd.com).

Sincerely,

Julian M. Suso
Town Manager

Cc: Board of Selectmen
Water Quality Management Committee
Other Appropriate Agencies

**COMPREHENSIVE WASTEWATER MANAGEMENT PLANNING PROJECT
SOUTH COAST WATERSHEDS AND RECOMMENDATIONS FOR
WEST FALMOUTH HARBOR WATERSHED
TOWN OF FALMOUTH, MASSACHUSETTS
MEPA Unit/Cape Cod Commission
Joint Review Process**

**Final Comprehensive Wastewater Management Plan (CWMP) and
Final Environmental Impact Report (FEIR), Document Distribution List**

A copy of the FINAL CWMP/FEIR/TWMP Document will be sent to the following:

Secretary of Energy and Environmental
Affairs
251 Causeway Street, Suite 900
Boston, MA 02114
Attn: N. Zavolas (2 Full Set)

Cape Cod Commission
3225 Main Street
Barnstable, MA 02630
(5 Full, 1 ES, Disk)

Senate President Therese Murray
10 Cordage Park Circle - Room 229
Plymouth, MA 02360 (ES Copy)

MassDEP Commissioner's Office
One Winter Street
Boston, MA 02108
(Full Set)

Massachusetts Department of
Environmental Protection
One Winter Street
Boston, MA 02108 (Full Set)

EOEEA Policy Director
Undersecretary for Policy
100 Cambridge Street, Suite 900
Boston, MA 02114 (Full Set)

DEP/Southeastern Regional Office
20 Riverside Drive
Lakeville, MA 02347
Attn: MEPA Unit (Full Set)

Brian Dudley
MassDEP
20 Riverside Drive
Lakeville, MA 02347
Attn: Brian Dudley (Full Set)

Department of Energy Resources
100 Cambridge Street, Suite 1020
Boston, MA 02114
Attn: John Ballam, MEPA Liaison
(Full Set)

Waquoit Bay National Estuaries
Research Reserve
P.O. Box 3092
Waquoit, MA 02536 (Full Set)
Attn: Alison Leschen

Massachusetts Historical Commission
Archives Building
220 Morrissey Boulevard
Boston, MA 02125 (ES Set)

Buzzards Bay Coalition
114 Front Street
New Bedford, MA 02740 (Full Set)

Deputy Base Engineer
971 South Outer Road
Otis ANG Base, MA 02542-133
(ES Set)

Executive Office of Transportation
10 Park Plaza, Room 3510
Boston, MA 02116-3969
Attn: Environmental Reviewer (ES Set)

Final CWMP and FEIR Document Distribution List (continued)

US Army Corps of Engineers
N.E. District
696 Virginia Road
Concord, MA 01742-2751 (ES Set)

USEPA New England Region I
5 Post Office Square
Suite 100
Boston, MA 02109-3912 (Full Set)

Coastal Zone Management
251 Causeway Street, Suite 800
Boston, MA 02202
Attn: R. Boeri (Full Set 2 copies)

Brian Howes, Ph.D. of SMAST
70 Summersea Road
Mashpee, MA 02649 (ES Set)

Coastal Zone Management
3195 Main Street, Route 6A
PO Box 220
Barnstable, MA 02630
Attn: Steve McKenna (Full Set)

Division of Marine Fisheries
1213 Purchase Street
New Bedford, MA 02740
Attn: Katherine Ford (ES Set)

Department of Conservation and Recreation
Division of State Parks and Recreation
251 Causeway Street, Suite 600
Boston, MA 02114-2104 (ES Set)

Massachusetts Division of Fisheries & Wildlife
One Rabbit Hill Road
Westborough, MA 01581
Attn: Thomas W. French, Ph.D.(ES Set)

Department of Agricultural Resources
16 West Experiment Station
University of Massachusetts
Amherst, MA 01003
Attn: MEPA Coordinator (ES Set)

Natural Heritage and Endangered
Species Program
Commonwealth of Massachusetts
Route 135
Westborough, MA 01581 (ES Set)

Department of Public Health (DPH)
Director of Environmental Health
250 Washington Street
Boston, MA 02115 (ES Set)

Massachusetts Highway Department
Public/Private Development Unit
10 Park Plaza
Boston, MA 02116 (ES Set)

Sandwich Library
142 Main Street
Sandwich, MA 02563
Attn: Richard J. Connor
(Full set)

Massachusetts Highway Department
District #5
1000 County Street, Box 111
Taunton, MA 02780
Attn: MEPA Coordinator (ES Set)

Town of Bourne Library
19 Sandwich Road
Bourne, MA 02532
Attn: Patrick Marshall (Full Set)

Nathan C. Weeks, P.E.
GHD Inc.
1545 Iyannough Road; Route 132
Hyannis, MA 02601 (Full Set)

Final CWMP and FEIR Document Distribution List (continued)

Representative Tim Madden
State House, Room 167
Boston, MA 02133 (ES Set)

Representative David Vieira
346 Gifford St Unit 3
Falmouth, MA 02540 (ES Set)

Department of the Army and Air Force
Massachusetts National Guard
Environmental Readiness Center
Building 1204, West Inner Road
Camp Edwards, MA 02542
Attn: Alan L. Cowles (ES Set)

Town of Mashpee Public Library
64 Steeple Street
PO Box 657
Mashpee, MA 02649
Attn: Kathleen Mahoney (Full set)

Town of Bourne
24 Perry Avenue
Buzzards Bay, MA 02532
Attn: Thomas M. Guerino, Town
Administrator (ES Set)

Town of Mashpee
16 Great Neck Road North
Mashpee, MA 02649
Attn: Tom Fudala, Town Planner
(ES Set)

Town of Falmouth DPW
59 Town Hall Square
Falmouth, MA 02540
Attn: Jerry Potamis, P.E

Lombardo Associates, Inc.
49 Edge Hill Road
Newton, MA 02467
(DISK)

30 copies with distribution to:

- Town Manager/BOS Office (7) – Full Set
- Health Agent/BOH Office – ES Set
- Conservation Agent/Cons. Comm.
Office – Full Set
- DPW (3) – Full Set
- Falmouth Libraries (3) – Full Set
- Planning Board – ES Set
- Finance Committee – ES Set
- Waterways Committee – ES Set
- Coastal Ponds Committee – ES Set
- WQMC (10) Full Set

Michael B. McGrath, P.E., P.L.S.
125 Cliffwood Lane
Falmouth, MA 02540
(DISK)

Commenters list: 10 total (All Receive Full Set)

Patricia Handley
(pamhan2011@hotmail.com)
PO Box 739
West Falmouth, MA 02574-0739

Robert F. Murphy
Chair, Cape Cod and Islands Group-Sierra
Club
P.O. Box 128
Cataumet, MA 02534-0128

Kate Bunker-Neto
18 Skehan Street
Somerville, MA 02143

Christina Rawley
8 Fay Road
Woods Hole, MA 02543

Final CWMP and FEIR Document Distribution List (continued)

Andrew Bunker
11 Westmoreland Drive
Falmouth, MA 02540

David Dow (ddow420@comcast.net)
18 Treetop Lane
Falmouth, MA 02540

Hilde Maingay and Earl Barnhart
28 Common Way
East Falmouth, MA 02536

Janet Kluever
447 Currier Road
East Falmouth, MA 02536

Molly Bang
43 Drumlin Road
Falmouth, MA 02540

The Association for Crocker' s Pond
c/o
MATTHEW WATSKY
ATTORNEY AT LAW
East Brook Executive Park
30 Eastbrook Road, Suite 301
Dedham, MA 02026



Table of Contents

Volume 1:

Executive Summary

ES.1	Background	1
ES.2	Summary of Past Studies: 1981 to Present	2
ES.3	Summary of Recommended Plan	3
ES.4	Estimated Costs and Financing Plan	7
ES.5	CWMP Project Completion and Implementation Timing	10
ES.6	Summary	14

Glossary of Common Acronyms

1 Introduction

1.1	Report Background and Purpose	1
1.2	Project Background and Planning Area	2
1.3	Wastewater Planning Project Scope	2
1.4	Public Review and Public Participation Program	4
1.5	Environmental Review Process	5
1.6	Planning Period	5
1.7	Blacksmith Shop Road WWTF Settlement Agreement and Proposed Effluent Discharge Permit	5
1.8	Organization of this CWMP/FEIR/TWMP	6

2 Summary of Previous Wastewater and Nitrogen Management Planning Evaluations and Reports

2.1	Introduction	1
2.2	Falmouth Wastewater and Nitrogen Management Planning Projects Completed Before this CWMP Project	1
2.3	Massachusetts Estuaries Project Evaluations and Resultant Nitrogen TMDL Limits	2
2.4	Previous Evaluations and Reports Completed as Part of this CWMP Project	2
2.5	Regional Wastewater and Nitrogen Management Efforts that Have Influenced this CWMP	3
2.6	Overview of Detailed Evaluations Completed as Part of this CWMP/FEIR/TWMP	4



3	Non-Traditional Nitrogen and Wastewater Management Technologies and Evaluations	
3.1	Introduction	1
3.2	Shellfish Aquaculture Demonstration Project to Harvest/Mitigate Excessive Nitrogen in the Estuaries	2
3.3	Inlet Widening of Bournes Pond with Considerations for Little Pond	6
3.4	Eco-Toilet Demonstration Project: Composting and Urine-Diverting Toilets	8
3.5	Permeable Reactive Barriers	18
3.6	Stormwater Management for the Little Pond Watershed	19
3.7	Development and Recent Town Passage of a Comprehensive Nitrogen Control Bylaw (for fertilizer)	23
3.8	Information Gathering on Individual-Property and Clustered Nitrogen-Removal Septic Systems	25
3.9	Ocean Outfall Evaluations	27
3.10	Potential Watershed Modifications for Increased Nitrogen Attenuation	31
3.11	Baseline Monitoring	33
4	Detailed Evaluations of Traditional Wastewater Management Alternatives	
4.1	Introduction	1
4.2	First Group of Detailed Evaluations Recommended from ENF: 2007 to 2008	1
4.3	Second Group of Detailed Evaluations for Water Reuse Through Total Organic Carbon Treatment and Well Infiltration: 2008 to 2009	4
4.4	Third Group of Detailed Evaluations Completed with the CWMP Review Committee: 2009 to 2010	6
4.5	Fourth Group of Detailed Evaluations Completed with the WQMC to Develop the Draft Report: 2011 to 2012	12
4.6	Fifth Group of Detailed Evaluations Completed with the WQMC to Address MEPA Comments and Develop the CWMP/FEIR/TWMP: 2012 to 2013	17
5	Public Participation and Outreach Program	
5.1	Introduction	1
5.2	Nutrient Management Working Group	1
5.3	Technical Advisory Group (TAG)	2
5.4	CWMP Review Committee	2
5.5	Water Quality Management Committee	3
5.6	Televised Presentations to the Board of Selectmen (BOS)	3
5.7	Development of Public Education Materials	4
5.8	Meetings with Community and Regional Groups	4
5.9	Coordination and Outreach to Neighboring Towns and the MMR	5
5.10	Coordination with the Town's Local Newspapers	5



5.11	Participation in the Formal MEPA and DRI Review Process	5
------	---	---

6 Recommended Plan

6.1	Demonstration Projects of Non-Traditional Wastewater and Nitrogen Management Technologies and Approaches	1
6.2	Traditional Wastewater Management	3
6.3	Estimated Costs and Financing Plan	4
6.4	CWMP Project Completion and Implementation Timing	7
6.5	Embayment Monitoring	11
6.6	Groundwater Monitoring	12
6.7	Crocker Pond Monitoring	13
6.8	Adaptive Management Plan	13
6.9	Considerations on Town Plans for TMDL Compliance at West Falmouth Harbor	15
6.10	Mitigation of Potential Construction Impacts	15

7 Summary of Environmental Impact Analysis

7.1	Introduction	1
7.2	Existing Environment	1
7.3	Assessment of Impacts	15
7.4	Regulation Standards	21
7.5	Alternative Ranking and Summary of Evaluations	24
7.6	Additional Considerations	25

8 MEPA Draft Section 61 Findings and Mitigation Measures

8.1	Introduction	1
8.2	Draft Section 61 Findings for State Agency Actions	1
8.3	Planned Mitigation Measures Design and Construction	3
8.4	Additional Mitigation Measures	6

Figures

Executive Summary:

ES-1	Location Map
ES-2	Estimated Future Wastewater Removal Percentages to Meet TMDLs
ES-3	Proposed Little Pond Sewer Service Area
ES-4	Blacksmith Shop Road WWTF Site
ES-5	Infiltration Beds at Site 7

Tables

Executive Summary:

ES-1	Estimated Costs and Financing Plans
------	-------------------------------------



ES-2 Project Completion and Implementation Timetable

Chapter 3:

3-1 Summary of Stormwater Nitrogen Loadings to the Planning Area Watershed

3-2 Summary of Fertilizer Nitrogen Loadings to the Planning Area

Chapter 4:

4-1 Summary of Sludge Management Alternatives

4-2 Projected Future Flows for Scenario 1E

4-3 Sand Infiltration Bed Site Summary

4-4 Summary of Costs for All Scenarios Evaluated for CWMP Review Committee

4-5 Scenario P12AAB, Fate of Treated Water Recharge Expressed as Percentage of Total Recharge

4-6 Cost Summary for Little Pond Sewer Service Extension

4-7 Summary of WWTF Improvements and Estimated Costs

4-8 Scenario 7_0.26, Fate of Treated Water Recharge Expressed as Percentage of Total Recharge

4-9 Phosphorus Attenuation Capacity Time Periods

Chapter 6:

6-1 Capital Costs for Recommended Wastewater Facilities

6-2 Estimated Costs and Financing Plans

6-3 Project Completion and Implementation Timetable

6-4 Baseline Monitoring for Crocker Pond

6-5 Evaluation Criteria Summary from WQMC Workshop in April 2012

Chapter 7:

7-1 Endangered, Threatened, or Species of Special Concern in the Town of Falmouth

7-2 Land Use

7-3 Environmental Impact Assessment

7-4 EPA Portfolio Manager Analysis of Falmouth WWTF

7-5 RISE Assessment of Solar Potential at the Falmouth WWTF

7-6 Summary of Modeled Nitrogen Concentrations for Present Conditions and Scenarios WFH-1 and WFH-2

7-7 Summary of Modeled Nitrogen Concentrations for Present Conditions and Scenario 1 (High Priority Nitrogen Mitigation Area Sewering) for Each Estuary and Watershed

7-8 Summary of Modeled Nitrogen Concentrations for Present Conditions and Scenario 2 for Little and Great Ponds



Volume 2:

Figures

Chapter 1:

1-1 Location Map

Chapter 2:

2-1 Estimated Existing Wastewater Nitrogen Removal Percentages to Meet TMDLs

2-2 Estimated Future Wastewater Removal Percentages to Meet TMDLs

Chapter 3:

3-1 Possible Outfall from Nobska Point

Chapter 4:

4-1 Original Planned Sewer Service Areas for Phase 1 and 2

4-2 Nitrogen Management Areas for Phase 1 and 2

4-3 Original Sites Screened for Treated Water Recharge Sites

4-4 Additional Potential Recharge and Treatment Sites

4-5 Wastewater Treatment Sites Considered for Alternative Scenarios 1A, 2A, and 3A

4-6 Revised High Priority Nitrogen Management Areas and Preferred Alternative Scenario 1E

4-7 Particle Tracks for Scenario P12AAB

4-8 Proposed Little Pond Sewer Service Area

4-9 Model Scenario P74AA

4-10 Not Used

4-11 Crocker Pond Location

4-12 Infiltration Beds at Site 7

Chapter 7:

7-1 Topographic Map

7-2 Surficial Geology Map

7-3 Soils Map

7-4 Water Resource and Historic Considerations for Planning Area

7-5 Sensitive Habitat Areas

7-6 Flood Zones

7-7 Open Space and Land Use Planning

7-8 Zoning Within Planning Area

7-9 Existing Blacksmith Shop Road Site & Site 7

7-10 Recommended Infiltration Beds at Site 7

7-11 Conceptual Water Quality Compliance Area (CWQCA)



Appendices

Chapter 1:

- 1-1 Article 17 Town Meeting Vote
- 1-2 Town of Falmouth Wastewater and Nutrient Management Vision and Strategies
- 1-3 Town of Falmouth CWMP Plan of Study, March 2007
- 1-4 EEA Certificate, DEIR Comment Letters, and Comment-Response Memorandum
- 1-5 Settlement Agreement and Blacksmith Shop Road WWTF Effluent Discharge Permit

Chapter 2:

- 2-1 Summary of Past Wastewater Facility Planning Projects
- 2-2 Summary of Massachusetts Estuaries Project (MEP) Evaluations and Development of Nitrogen TMDLs
- 2-3 Summary of Needs Assessment Report, October 2007
- 2-4 Copy of Needs Assessment Report, October 2007
- 2-5 Summary of Alternatives Screening Analysis Report, November 2007
- 2-6 Copy of Alternatives Screening Analysis Report, November 2007
- 2-7 Copy of ENF Document, December 2007
- 2-8 Regional Wastewater and Nutrient Management Efforts

Chapter 3:

- 3-1 Shellfish Demonstration Project Items
- 3-2 Summary of Pre-Article 17 Inlet Opening Evaluations
- 3-3 March 2008 Technical Memorandum on Coastal Pond Inlet Opening Evaluations
- 3-4 March 2013 Technical Memorandum BP-1 on Bournes Pond Inlet Opening Evaluations
- 3-5 Eco-Toilet Demonstration Project Items
- 3-6 Permeable Reactive Barriers (PRBs) Demonstration Project Items
- 3-7 Stormwater Management Demonstration Project Items
- 3-8 Fertilizer Demonstration Project Items
- 3-9 Not Used
- 3-10 Journal of Boston Society of Civil Engineers Articles on Ocean Outfall Evaluations in Falmouth in the 1970's
- 3-11 Ocean Outfall Cost Summary
- 3-12 Buzzards Bay Workshop Items on a Potential Ocean Outfall at Nobska Point
- 3-13 Not Used
- 3-14 Technical Memorandum on Evaluation of Potential Watershed Modifications for Increased Nitrogen Attenuation



Chapter 4:

- 4-1 Alternative Technologies, Solutions, and Sites Selected for Detailed Evaluation from the Alternatives Screening Process
- 4-2 Excerpts from Alternatives Screening Analysis Report on Initial Site Evaluations
- 4-3 Technical Memorandum No. 2—Additional Recharge Site Evaluations
- 4-4 Summary of Detailed Evaluations for Sludge Management
- 4-5 Evaluation Summary for Scenarios 1A, 2A, and 3A
- 4-6 Groundwater Modeling Guidance Document and Case Study on Falmouth Country Club Site Recharge
- 4-7 Evaluation Summary for Well Injection Technology
- 4-8 Evaluation Summary of TOC Removal Technologies and Concepts
- 4-9 Technical Memorandum No. 1 on Cost Development for Five Alternative Scenarios
- 4-10 Technical Memorandum No. 3 on West Falmouth Harbor and Scranton Avenue Sewer Implementation Costs
- 4-11 Technical Memorandum No. 4 on Options for Project Phasing
- 4-12 Technical Memorandum No. 5 on Federal and State Funding Opportunities
- 4-13 Technical Memorandum No. 6 on Cost and Non-Monetary Comparison for Centralized Versus Cluster-System Wastewater Management for Seacoast Shores Peninsula
- 4-14 CWMP Review Committee Project Newsletters, Fact Sheets, and Findings Documents
- 4-15 Technical Memorandum No. 7 on Evaluation and Summary of Committee's Preferred Option
- 4-16 Not Used
- 4-17 Summary of Costs for Scenario 1E
- 4-18 Not Used
- 4-19 Technical Memorandum No. 8 on Hydraulic Load Tests
- 4-20 Technical Memorandum No. 9 on Groundwater Modeling at Sites 7 and 10
- 4-21 Archaeological Assessment Report for Sites 7 and 10
- 4-22 Initial Detailed Evaluation of Sewershed Delineation and Capital Costs for the Little Pond Area
- 4-23 Technical Memorandum S-0 Collection System Technology Comparison
- 4-24 Technical Memorandum S-1 Lower Little Pond Service Area Evaluation
- 4-25 Technical Memorandum S-2 Preliminary Design for Lower Little Pond Service Area
- 4-26 Technical Memorandum S-3 Existing Collection System Evaluation
- 4-27 Technical Memorandum S-4 Hydraulic Balance
- 4-28 Technical Memorandum PS-1 Pumping Stations Condition Assessment
- 4-29 Technical Memorandum WW-1 Existing WWTF and Vent Evaluation
- 4-30 Technical Memorandum TW-1 Preliminary Design Evaluations for Site 7 Development



4-31	Summary of Evaluations for Preliminary Design Flow from Little Pond Sewer Service Area
4-32	Summary of Groundwater Modeling of Revised Flow at Site 7, Technical Memorandum No. 12
4-33	EcoLogic, LLC Report dated August 8, 2013, Potential Soil Attenuation of Phosphorus Migration from Infiltrating Treated Water Recharge at Site 7
4-34	Not Used
4-35	SMAST Evaluations of Possible Water Quality Impacts to Buzzards Bay from the Site 7 Recharge
4-36	Stakeholder Meeting Items
Chapter 6:	
6-1	Falmouth Capital Improvements Plan (CIP) FY 2010-2015
Chapter 7:	
7-1	Portfolio Manager Items for GHG Evaluations
7-2	Technical Memorandum No. 10 on Water Quality Modeling
7-3	Technical Memorandum No. 11 on Water Quality Modeling



Glossary of Common Acronyms

ACEC	Area of Critical Environmental Concern
ACRE	Applied Coastal Research and Engineering, Inc.
AFB	Air Force Base
AGO	Attorney General's Office
APCC	Association to Preserve Cape Cod
ARRA	American Recovery and Reinvestment Act
ASAR	Alternatives Screening Analysis Report
BBC	Buzzards Bay Coalition
BCDHE	Barnstable County Department of Health and Environment
BMP	Best Management Practices
BOD	Biochemical Oxygen Demand
BOH	Board of Health
BOS	Board of Selectmen
BSR	Blacksmith Shop Road
CCC	Cape Cod Commission
CCWPC	Cape Cod Water Protection Collaborative
CDAG	Community Development Action Grant
CDM	Camp, Dresser & McKee, Inc.
CEC	Contaminants of Emerging Concern
CFR	Code of Federal Regulations
CIP	Capital Improvement Plan
CMAST	Center for Marine Science and Technology
CMR	Code of Massachusetts Regulations
CRWG	Coastal Resources Working Group
CVI	Coastal Vulnerability Index
CWMP	Comprehensive Wastewater Management Planning
CWMP/FEIR/TWMP	Comprehensive Wastewater Management Plan and Final Environmental Impact Report, and Targeted Watershed Management Plan
CWQCA	Conceptual Water Quality Compliance Area
CZM	Coastal Zone Management



DCPC	District of Critical Planning Concern
DCR	Department of Conservation and Recreation
DCWMP/DEIR	Draft CWMP and Draft Environmental Impact Report
DIN	Dissolved Inorganic Nitrogen
DMF	Division of Marine Fisheries
DO	Dissolved Oxygen
DOER	Department of Energy Resources
DON	Dissolved Organic Nitrogen
DPW	Department of Public Works
DRI	Development of Regional Impact
DSS	Denitrifying Septic System
ECM	Energy Conservation Measures
EEA	Energy and Environmental Affairs
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
ENF	Environmental Notification Form
ENR	Enhanced Nitrogen Removal
EOEEA	Executive Office of Energy and Environmental Affairs
EPA	Environmental Protection Agency
FACES	Falmouth Association Concerned with Estuaries and Saltponds
FCC	Falmouth Country Club
FCWG	Falmouth Coastal Working Group
FCWMP/FEIR	Final Comprehensive Wastewater Management Plan and Final Environmental Impact Report
FEMA	Federal Emergency Management Agency
FFL	Falmouth Friendly Lawn
GAC	Granular Activated Carbon
GHD	GHD Inc.
GHG	Greenhouse Gas
GIS	Geographic information System
gpd	Gallons per day
gpd/sf	Gallons per day per square foot
GWDP	Groundwater Discharge Permit Program
HDPE	High Density Polyethylene



I/A	Innovative and Alternative
IGA	Investment Grade Audit
I/I	Infiltration/inflow
kW	Kilowatt
LCP	Local Comprehensive Plan
LID	Low Impact Development
MassDEP	Massachusetts Department of Environmental Protection
MassDOT	Massachusetts Department of Transportation
MEP	Massachusetts Estuaries Project
MEPA	Massachusetts Environmental Policy Act
MESA	Massachusetts Endangered Species Act
mgd	million gallons per day
mg/L	milligrams per liter
M.G.L.	Massachusetts General Law
MHC	Massachusetts Historical Commission
MLSS	Mixed Liquor Suspended Solids
MMR	Massachusetts Military Reservation
MSL	Mean Sea Level
MSX	Multinucleated Sphere Unknown
MWRA	Massachusetts Water Resources Authority
NAAQS	National Ambient Air Quality Standards
NAR	Needs Assessment Report
NEPA	National Environmental Policy Act
NERR	National Estuarine Research Reserve
NHESP	Natural Heritage and Endangered Species Program
NMWG	Nutrient Management Working Group
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NPDES	National Pollutant Discharge Evaluation System
NRCS	National Resource Conservation Services
NWI	National Wetlands Inventory
N ₂	Nitrogen Gas



OH	Hydroxyl
OSDS	Onsite Sewage Disposal System
OSHA	Occupational Safety and Health Administration
O&M	Operations & Maintenance
PAL	Public Archaeology Laboratory
PEF	Project Evaluation Form
PON	Particulate Organic Nitrogen
ppm	parts per million
PRB	Permeable Reactive Barrier
psi	pounds per square inch
PV	Photovoltaic
PWED	Public Works Economic Development
QAPP	Quality Assurance Project Plan
RO	Reverse Osmosis
ROW	Right-of-Way
SCDHS	Suffolk County Department of Health Services
sf	Square Foot
SMASST	School of Marine Science and Technology
SRF	State Revolving Fund
SW	Science Wares Inc.
SWPPP	Stormwater Pollution Prevention Plan
S&W	Stearns & Wheler, LLC
TAG	Technical Advisory Group
TM	Technical Memorandum
TMDL	Total Maximum Daily Load
TN	Total Nitrogen
TOC	Total Organic Carbon
TWMP	Targeted Watershed Management Plan
UCWSC	Upper Cape Water Supply Cooperative
UD	Urine Diverting
UMass	University of Massachusetts
UNHSC	University of New Hampshire Stormwater Center
USDA	United States Department of Agriculture



USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UV	Ultraviolet
VFD	Variable Frequency Drive
WBNERR	Waquoit Bay National Estuarine Research Reserve
WHG	Woods Hole Group
WHOI	Woods Hole Oceanographic Institute
WPA	Wetlands Protection Act
WPCF	Water Pollution Control Facility
WQMC	Water Quality Management Committee
WWTF	Wastewater Treatment Facility
ZOC	Zone of Contribution

Additional Items:

Draft Report	Draft Comprehensive Wastewater Management Plan and Draft Environmental Impact Report, and Notice of Project Change, July 30, 2012
--------------	---